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Abstract

THE COLD NEUTRON SEPARATION FROM THE SPECTRA OF THE HORISONTAL BEAMS OF THE V.V.R.S. REACTOR

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Lately it was shown that the introduction in a reactor neutron beam of a system of surfaces allowing total multiple neutron reflexion may provide an efficient means for obtaining relatively intensive neutron beams, whose spectrum is shifted to the low energy domain relative to the neutron spectrum incident on the system.

The purpose of the present paper was to establish the efficiency of this method as a function of :

1. quality of the reflective surface,
2. the angular horisontal divergence defined by the reflectant surfaces,
3. the axis angle of the two elements defining the thermal neutron path.

The measurements have been performed at the VVRS reactor horisontal neutron beam placing in the neutron beam a system containing two collimators with variable aperture, with axes at a variable angle.

Surfaces with several reflectivities were used for defining the collimation system.

The obtained results lead to the following conclusions:

1. the transmitted neutron energy spectra at high

energies are sensibly influenced by the reflectivity of surfaces composing the collimation system,

2. the integral transmitted neutron intensity and the energy spectra shift in the low energy range can be usefully modified by varying the collimation system's horisontal angular divergence and the relative reflectivity of the slit walls.

The experimental data showed that the building of a reflectant collimator system of "Soller type" is possible; such a system is in course of assembling to the VVRS reactor beam.